

BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An open forum for brief discussions of the workaday problems of the bedside doctor. Suggestions for subjects for discussion invited.

PAIN AND NEURITIS

Arthur L. Fisher, San Francisco.—Neuritis is a popular diagnosis with both the doctors and the laity, but neuritis is a rare disease. It does exist, but it is not common. A generation ago the term "rheumatism" occupied the place now held by the word "neuritis." Both these terms are used to mean pain. Patients do not like being told they have a pain—they know that already. If told they have neuritis they are better satisfied.

The duty of the physician is to find the cause of the "neuritis"; not simply to treat the pain.

If one understands the mechanism of the production of pain it is far easier to trace the source of it. Consider first that location where the anatomy of the nerves (the conductor of the pain) is well known. I refer to the hip-joint. It is well known that a child with hip-joint disease frequently does not complain of pain in the hip at all, but in the knee region. The explanation of the mechanism of this pain is the explanation of practically all joint pains. A portion of the hip-joint is supplied with sensory fibers by a branch of the obturator nerve. Afferent impulses travel along this branch to a certain level of the spinal cord; from this same level efferent impulses are sent out and are perceived at or near the periphery of the nerves: *e. g.*, when one strikes his "funny bone" the pain is felt in the fingers.

If one bear these afferent and efferent impulses in mind the understanding of some of the "neuritic" pains is very easy.

Consider sacro-iliac pain. In the typical case the pain is felt down the sciatic nerve, but not necessarily as, in some cases, it is referred to the lumbosacral region only and in others to both. In this case the anatomy of the nerve supply is unknown. It is a problem yet to be worked out; but the most probable explanation is that of a multiple nerve supply—different nerves supplying sensory fibers to different parts of the joint. If one portion of the joint, supplied mainly by fibers from the sciatic, be affected, then the afferent impulse travels along a sciatic branch to a certain level of the cord and the efferent impulses are sent out from the cord along the main branches of the sciatic and hence the pain is perceived in the leg.

If, on the other hand, that portion of the joint supplied by one of the lumbar nerves becomes irritated, then the afferent impulse will travel along a branch of a lumbar nerve to the cord and be sent out again along the lumbar nerves to the lower part of the back and the pain be perceived

there. Or in other instances both portions of the joint may be irritated and pain perceived in both the back and the lower extremity.

"Neuritic" pains occur in the arms also; they usually arise from one of four places: (1) the joints of cervical spine; (2) shoulder joint; (3) subdeltoid bursa; and (4) acromioclavicular joint. In each case an inflammatory change in one of the structures mentioned causes the pain, and differential diagnosis should be directed toward them.

One frequently hears that nerves are impinged upon as they pass through the spinal foramina and that the pain originates from pressure on the nerve. This I believe to be untrue, for it seems impossible to have a mixed motor and sensory nerve come through a foramen—that is too small for it and have the pressure exerted on the sensory part of the nerve only. If pressure were exerted on the nerve the motor portion would suffer just as, if not more, readily than the sensory.

When pain is arthritic in nature it is due to two causes: first, the pain of active inflammation, and, second, sprain pain. An inflamed joint is an injured joint the bearing surface of which is not always smooth and hence easily sprained. It is for this reason that arthritis frequently causes pain after the active disease has been arrested. It is also for this reason that industrial injuries in arthritis are so difficult to evaluate fairly.

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John William Shuman, Los Angeles.—Pain is the most frequent complaint of the distressed and suffering patient. It is a subjective symptom, cannot be measured, and may be real or imaginary. Pain is often a blessing in disguise which causes the owner to seek relief when the cause would have been disregarded.

Patients have difficulty expressing their pain sense in words, hence the terms "ache," "hurt," and "misery." The wise physician listens attentively to the complaints of the patient and tries to interpret correctly. He quizzes regarding the intensity, location, persistence, and type of pain.

Regional pain is as follows: head, chest, back, belly, and limb. Acute head, back and limb pains usher in such infections as smallpox, typhoid, and tonsillitis. Chronic head pain calls for differential diagnosis between arterial hypertension, sinusitis, nephritis, and brain tumor. Nocturnal headache speaks for tertiary syphilis as a cause.

Pleuritic pains are stitch-like in character and are present at the end of inspiration. Angina pec-

toris is diagnosed from intravertebral arthritis by the fact that with the latter each movement of the torso causes pain. Careful examination of the vertebral column by eyes and fingers, aided by the x-ray, will elicit symptoms for or against disease of the vertebrae.

Pain referred to the back may have its cause in the abdomen and limbs. Right lower abdominal pain has caused right rectus incisions, for appendectomy, when the cause was either diaphragmatic pleurisy, central pneumonia, purpura, or malaria.

Pain in the knee from hip-joint tuberculosis is well known. The lancinating, lightning or shooting pains of tabes dorsalis, especially in the lower limbs, must be diagnosed from arteritis obliterans, sciatica and varicosities; also the girdle pains of syphilis from "hunger pain" of gastric ulcer.

We must be mindful of the persisting painful sensations noted in psychasthenia and of the "pain-joy" in hysteria.

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Charles Lewis Allen, Los Angeles.—Many patients and not a few physicians attribute persistent pains of obscure origin to neuritis.

While nerves always transmit pain, pain does not necessarily originate in them. In the majority of cases their fibers simply transmit the painful stimuli from other organs to the perception centers.

Since nearly all nerves contain both afferent and efferent fibers, inflammation affecting them is usually productive of impairment or loss of motion and sensation and of vasomotor phenomena, as well as of pain, which last may be slight if the inflammation is not acute. These symptoms are limited to the motor and sensory distribution of the affected nerve or nerves.

It is true that pain may be the chief feature, especially at the start. Pain so distributed if unaccompanied by other symptoms, we are accustomed to attribute to "neuralgia," a painful condition in a nerve the exact mechanism of which we are ignorant.

Probably many cases of neuralgia are due to a neuritis which does not proceed beyond the irritative stage.

Since nerves lie in close relationship to other structures in which pain may originate, it is often difficult to decide just where the trouble starts. Particularly is this the case in muscular areas. In general, muscle fibers when inflamed are less sensitive to pressure than nerves, the pain has not a characteristic distribution and is much intensified when the muscle contracts.

In the lumbar and intercostal regions the differentiation is especially difficult, since the pain may follow the course of the intercostal nerve, or the sciatic respectively. Most lumbagos are regarded as due to fibrositis or fibromyositis, but many back pains are reflex in origin, while sacroiliac disease must always be considered.

The posterior roots of the spinal cord have a skin representation quite different from that of

the peripheral nerves, as demonstrated chiefly by Head, to whom we also owe an explanation of the fact that visceral disease is often accompanied by pain in surface areas supplied from the same spinal segment. His figures reproduced in our textbooks afford a useful orientation.

Neuritis may affect any part of a nerve and even the spinal roots, a "radiculitis."

Segmental pain and other loss of function should attract our attention to the vertebral canal since it is often secondary to meningitis—usually syphilitic, tumor, or bone lesion. Witness the lightning pains and girdle sensation in tabes; pain in the back of neck, up the occiput and down the arms in cervical pachymeningitis; the hyperesthesias, anesthetics, and loss of function in transverse lesions and those of the cauda equina.

In diagnosing the cause of pain, the bones, muscles, and fascia should come under investigation, while search for possible reflex sources of pain in the thoracic, abdominal and pelvic organs should be made. The condition of tendon and skin reflexes, of sensation and the reaction of the pupils to light, will furnish important indications.

Only the demonstration of a thickened and sensitive nerve or of the distribution of pain and loss of function over a definite nerve area, perhaps confirmed by muscular atrophy and change in electric reactions, will justify a diagnosis of neuritis.

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F. M. Pottenger, Monrovia.—The sensory nerves of the body possess receptors which are adapted to picking up and transmitting various types of impulses. We are too apt to think of sensory changes and pain as being synonymous. Pain is only one of a number of sensory disturbances. We meet in the clinic dull pain and sensations of a burning, boring or cold character, the sensation of motion, the sensation of equilibrium, and many other types of sensation. Head particularly has described many sensory phenomena.

The receptor which picks up a sensation is one which is adapted to that particular stimulus. Physiologically, receptors for various sensations are adjusted to the part where such sensations originate. Thus, the receptors for sight are confined to the tissues which receive light impressions; those for hearing to those which receive impressions of sound, and those for pain, to those which are adapted to ordinary stimuli.

Viscera are so protected by their position within the body that they have no necessity for noting ordinary phenomena which the skeletal tissues are obliged to take cognizance of. Therefore they are not sensitive to those stimuli which cause pain on the surface of the body. Furthermore stimuli which originate in the viscera and are translated into pain, have the pain expressed by sensory skeletal nerves whose cell bodies lie adjacent in the central nervous system to the afferent visceral

nerves which carry the stimulus centralward, according to the following law of Head: "When a painful stimulus is applied to a part of low sensibility (the various viscera) in close central connection with a part of much greater sensibility (the parts supplied by the segmental somatic nerves) the pain produced is felt in the part of higher sensibility rather than in the part of lower sensibility to which the stimulus was actually applied."

Visceral pain, therefore, is a referred pain—a pain referred to the surface of the body, the connection taking place in the embryologic segment to which the particular organ is related in its nerve connections.

Since visceral pain is expressed through the somatic nerves, by knowing the relationship which each important viscus bears to the spinal segments developmentally, we may follow out the sensory nerves from those segments and find the chief location of pain for each particular viscus.

Referred pain may accidentally be over the viscus from which the impulses causing the pain originate, as in the pleura and peritoneum, or, it may be far removed from the organ, as the arm pain in angina, or the shoulder pain in diaphragmatic pleurisy.

One of the most interesting types of pain is recurrent pain. Patients who have a chronic illness involving any particular organ have impulses traveling centralward over the afferent nerves from that organ for a long period of time. Under conditions of health a certain degree of stimulation will travel centralward over the afferent nerves from an organ without being perceived by consciousness; and there is a certain degree of latitude in the strength of the stimulus required to break down the inhibition offered by the higher levels.

As a result of long-continued bombardment of neurons by harmful stimuli they become hypersensitive, so that they respond more easily than normal; and at the same time inhibition is broken down, so that whenever an unusual stimulus comes to the nervous system, these injured sensory neurons are unable to withstand a normal amount of stimulation and, with the inhibition of the higher centers impaired, they react with pain. This offers an explanation for the recurrent pain in chronic visceral inflammation, which is so often found in the neurons which refer the pain to the body surface. For example, the woman with chronic pelvic inflammation, or the individual who has had pleurisy, or one who has had an inflamed kidney or gall bladder, will, under many conditions of extra physiologic demand, such as those caused by tiring, worry, discontent, overwork, menstruation, and sudden changes in weather, find the injured neurons unable to make the necessary physiologic adjustment and so respond with pain; while in uninjured neurons connected with other viscera there will be no pain.

Inspection of Vaccines and Serums.—The United States Public Health Service, in connection with its inspection of biologic products as required by law, performs a service of inestimable value to the general public. Before a biologic product, such as a serum, toxin, vaccine or antitoxin, may be sold in the United States in interstate or international commerce a license must be obtained from the Public Health Service. The granting of a license means that inspection of the establishment concerned and laboratory examinations of samples of its products are made regularly to insure the observance of safe methods of manufacture, to ascertain freedom from contamination and to determine the purity or safety, or both, of the various products, and the potency in cases where standards exist. From time to time lists of the manufacturing firms which produce such products as are licensed are published, together with the names of the products for which they are licensed. Such a list recently issued by the Public Health Service emphasizes the importance of this work.—*Health News*.

University of California Students Aid University.—With the cost of their \$1,463,000 Memorial Stadium totally paid except for \$200,000 in scrip which will be discharged by ticket sales within the next two years, students of the University of California have laid plans to cooperate with the regents in a campus expansion calling for the expenditure of approximately \$1,500,000, according to an announcement just made by William Monahan, graduate manager.

The first payment toward this program, \$100,000 in cash, has just been turned over to the university, and the rest will be paid in yearly instalments from football game income. The expansion program includes the purchase of almost eight acres of land in the residential district adjacent to the campus. This land will be used to take the place of drill fields and athletic fields which the university has found necessary to appropriate for building purposes.

In explaining the plan, Vice-President and Comptroller Robert G. Sproul points out that with the steady growth of the university, necessitating the erection of more and more buildings, the area of level ground on the campus available for military drill, physical education classes, and sports in general has been reduced to such an extent that the students are left without adequate space for the activity required for maintenance of health.

"By offering their cooperation," he says, "the students are making a gift of magnificent proportions to the state, and freeing an equal sum for academic building purposes. This will be the third contribution of land to the state that has been made by the students from football game receipts. One tract of land on the southern border of the campus was purchased a score of years ago at a cost of \$31,890. This area is now partly occupied by the new Hearst Memorial Gymnasium. Another tract of land costing \$267,842 was purchased a few years ago to fill out the area necessary for the erection of the Stadium."

In addition to these contributions of land to which football profits have been diverted, the students also contributed \$90,000 toward the erection of Stephens Union building, student center, thereby freeing another university building for academic uses. Later they furnished \$132,225 for the furnishing and equipping of this new building. Also each year they contribute \$1,391.84 toward the upkeep of the west end of the campus which is used for drill, physical education and sports.—*U. C. Clip Sheet*.

Does Education Pay?—Education pays, not only in a richer life, but in money returns. An investigation of the earnings of nearly five thousand people in all parts of the United States showed that the average incomes of the more highly educated were greater at each stage of life, and that advance in income came to an end earlier for the less educated groups—at fifty years of age for those with common-school education and at fifty-five for those with high-school training, while it did not come to an end for college-trained men until the early sixties.—*U. S. Department of Labor*.